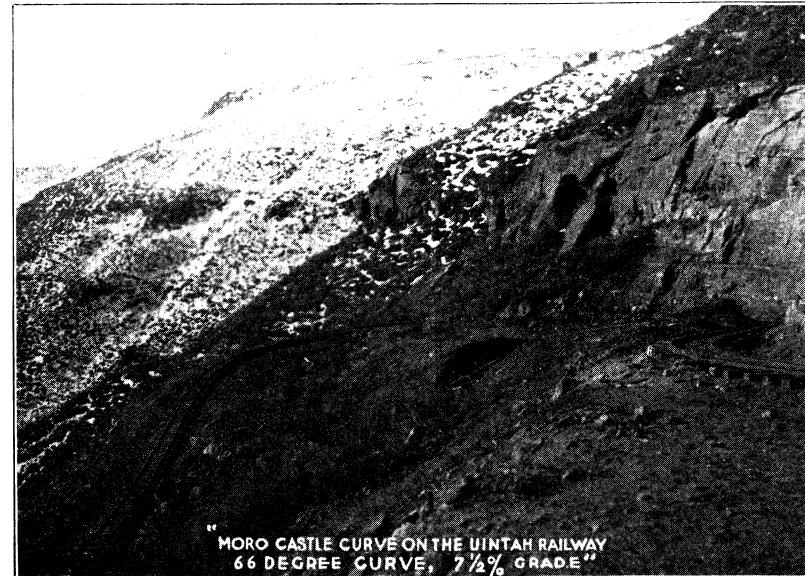


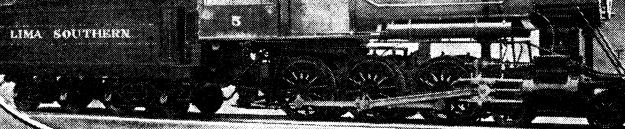
AUGUST, 1911

THE LOCOMOTIVE WORLD

LOGGING MINING
PLANTATION INDUSTRIAL & STANDARD RAILROAD MOTIVE POWER



LIMA SOUTHERN





DECKING LOGS HIGHER means skidding them from a greater distance, consequently requiring less track building, which costs money.

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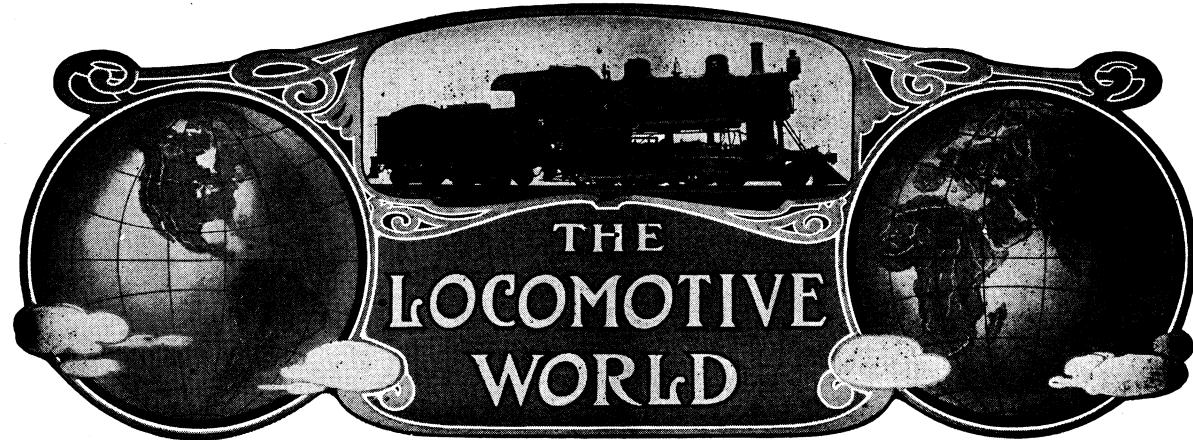
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Devoted to the interest of private users of Locomotives and Equipment for Logging, Mining, Plantation and Industrial Railroads.

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NOTICE TO ADVERTISERS.

Advertising rates furnished upon application. Change in advertisements intended for a particular issue should reach the office of the Locomotive World no later than the 20th of the month prior to the date of issue. New advertisements requiring no proof can be received up to the 1st of the month of date of issue.

THE FRANKLIN TYPE AND PRINTING COMPANY

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FLANGE WEAR

THERE is probably not another one thing which causes the private railroad owners any more trouble than that of flange wear to drivers of their locomotives. The reason for this is due no doubt on account of the fact that the majority of private railroad lines contain many sharp curves, which cause the flanges to wear

much faster than if locomotives are operating on straight track. Our trunk railroads in laying out their lines keep from encountering curves as much as possible, not only on account of the flange wear on drivers, but also for the reason that curves cause resistance which means loss in power, cause greater wear and tear on all rolling stock and make the operating of the road more dangerous. However, many of these reasons cannot be considered by the private railroad owner, as if he did he would increase the cost of the construction of his road to such a figure that would make it an unprofitable investment. It, therefore, behooves the owners of private railroads to devise some method to prevent the cause which is giving him trouble, in some other manner.

There are two classes of expense due to excessive flange wear. One results from the metal lost in producing standard flanges after they have been badly worn and the other is due to the loss of revenue and the cost of repairs when necessary to turn or remove tires from flange wear between regular shoppings of the engine.

At the last Master Mechanic's Association meeting the committee on "Flange Lubrication" reported that out of thirty railroads to which a circular of inquiry was issued, there were only two which stated they were not having trouble from this source. Their report shows that on a certain road, before adoption of flange lubrication, Atlantic type locomotives averaged 18600 miles between tire turnings before reaching the limit of 1-inch vertical flange wear. Since the adoption of flange lubrication, the same locomotives average 60,400 miles between tire turnings for tread wear. This goes to show

plainly that if flange lubrication will make such a difference in the wear of tires as this on a trunk line railroad where the maximum curves range from 6° to 14° it certainly would greatly prolong the life of tires on locomotives in use on private railroads where the curves are seldom less than 20°.

There are fourteen different forms of flange lubricators now in use on the regular railroads. They may be classed in five classes: (1) crude oil, (2) engine and car oil, (3) solid lubricant, (4) water, (5) exhaust steam.

The Santa Fe Railroad is using crude oil, and the type of lubricator used is known "wood block".

This we believe to be an inexpensive lubricator and no doubt can be made by the Private Railroad owners. There are a number of patent flange lubricators on the market, but they are all quite expensive. Most of them use a solid lubricant. It is claimed by some of the railroads that lubricator using solid lubricant or hard grease loses its merit in either wet or cold weather.

One thing the owner of the private railroad will have to watch, and that is see that the flange lubricator which they may install does not throw the oil on the tread of the tire so it gets directly on the ball of the rail, as should this happen it might cause a slippery track and accidents will occur on the heavy grades.

Any one interested in flange oilers can write to Mr. M. H. Haig, Mech. Engineer, Atchison, Topeka & Santa Fe Ry. Co., Topeka, Kansas, and he no doubt can furnish information on the best type to install. Mr. Haig was Chairman of the Committee on "Flange Lubrication" Master Mechanic's Association, Forty-fourth Annual Convention held at Atlantic City, New Jersey, June 17th to June 21, 1911.

COAL CONSUMPTION IN HEAT UNITS.

A heat unit is the measure that scientists employ to express the quantity of heat dealt with in all scientific and engineering processes. The amount of heat represented ought to be as intelligible to ordinary persons as the weight represented by one pound of the volume of one gallon, but somehow few people understand the details of heat measurement.

One heat unit is the amount of heat required

to raise the temperature of one pound of water one degree Fahr. at its greatest density, which is 39 degs. Fahr. In ordinary practice the evaporating of one pound of water at any temperature is called a heat unit. To the ordinary reader that statement does not convey much intelligible information. A heat unit represents the amount of energy needed to perform 778.3 foot pounds of work. As one horse-power represents the energy expended in raising 33,000 pounds one foot high per minute, about 42 heat units represent one-horse power.

Careful experiments have demonstrated that the combustion of one pound of good quality of coal contains about 14,500 heat units, each equivalent to 778.3 foot pounds. If then the heat of combustion of one pound of coal could be employed in raising a weight of one pound it would raise it $14,500 \times 778.3 = 112,853,500$ feet, or more than 2,100 miles. The proportion of this heat energy, converted into useful work is very small, less than 10 per cent., when used in the very best steam engines. Locomotives very seldom utilize more than 4 per cent. of the heat energy of coal.

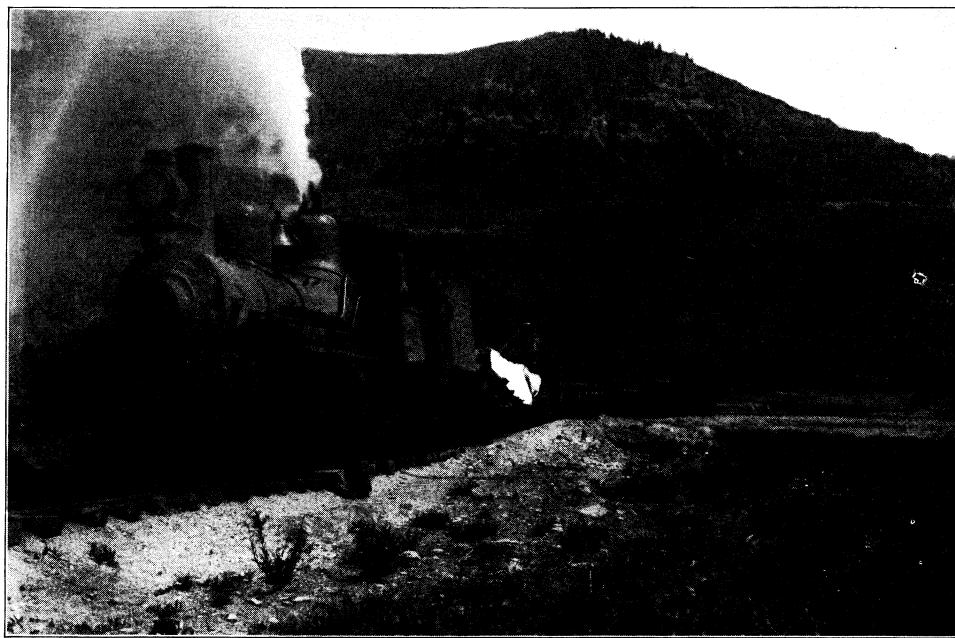
When one gets converting the number of tons of coal used daily or weekly into heat unit figures, the sums become so formidable that we regard them with amazement. For instance, the Erie Railroad uses in its locomotives about 50,000 tons of bituminous coal every week. Any of our readers who enjoy long numbers might work out the sum $112,853,500 \times 50,000 \times 2,000 =$ and see how it looks. —*The Railway & Locomotive Engineering*.

ALL WIRE ROPES USED IN OUTSIDE OPERATIONS suffer more or less from oxidation or rusting, and wire ropes running underground are frequently subjected to the corroding influence of water containing acids, which is still more destructive; and it is very necessary, therefore, that such ropes should be properly coated with some suitable material. For ropes subjected only to atmospheric conditions, a good quality of boiled linseed oil, or pine tar thinned with turpentine, will answer the purpose; but for ropes coming in contact with water, and especially with water containing acids, some of the preparations of crude petroleum, or a mixture of this with graphite, should be used.

THE UNTAH RAILWAY

THE UNTAH RAILWAY is a narrow-gauge railroad in western Colorado and eastern Utah. It extends fifty-four miles northward to Dragon from Mack, its southern terminus and junction point with the Rio Grande Western Railroad. Mack is in the broad, fertile valley of the Grand River, twenty miles westward from Grand Junction, Colorado, and, while a small community, is yet destined to grow to considerable importance as a railroad town, surrounded, as it is, by land unexcelled in fertility when brought under irrigation.

Nowhere in the United States has there been a more astonishing result in the irrigation of arid lands and their conversion into beautiful farms than during the past ten years in this valley of the Grand River. From Fruita, seven miles east of Mack, to Palisade, twenty-five miles further east, there is an uninterrupted series of prosperous farms growing all the varieties of fruits and vegetables for which the irrigated Colorado lands of comparatively low elevation are noted. Colorado

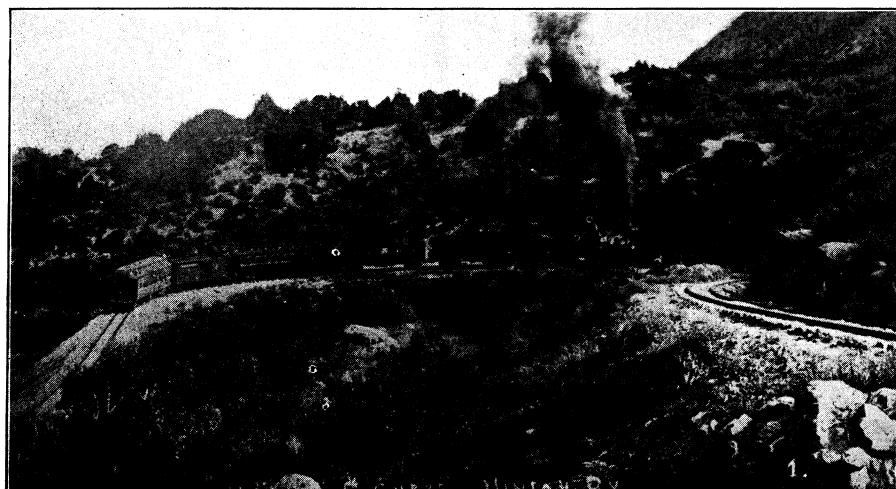
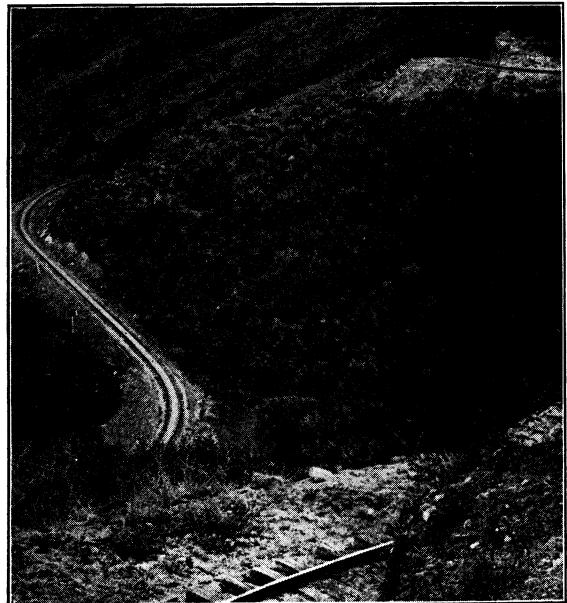
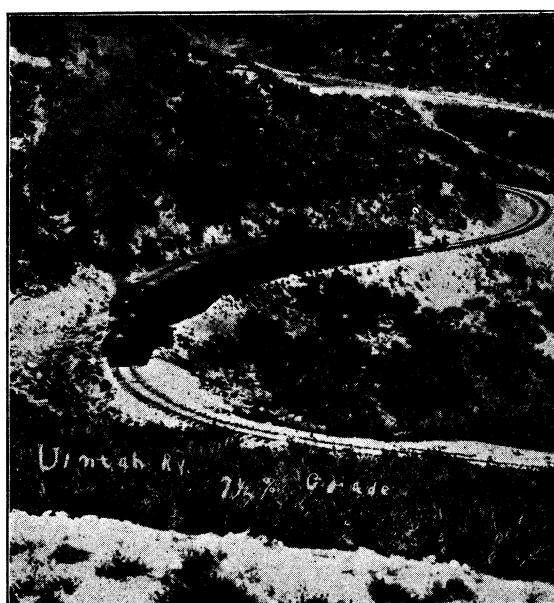
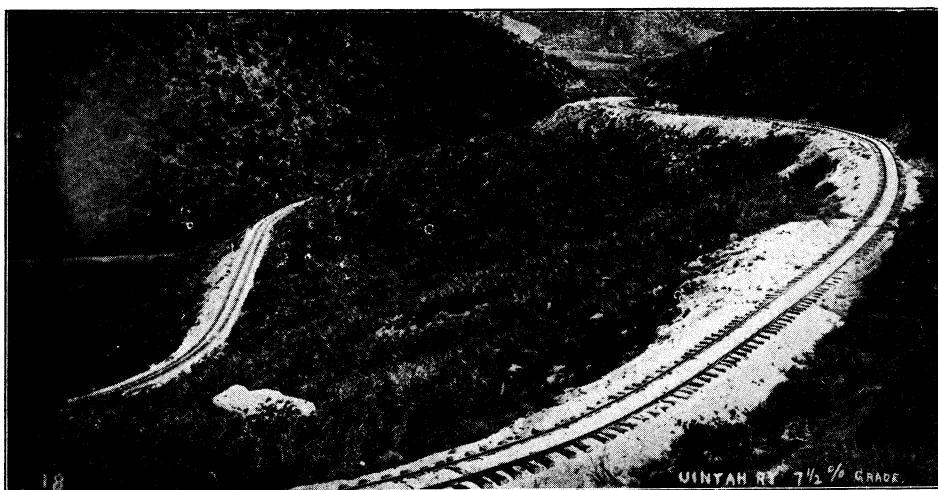


TWO SHAY LOCOMOTIVES WITH TRAIN OF ASPHALTUM ON WEST SIDE
WHERE AVERAGE GRADE IS 5 1-2 PER CENT

melons have won a well-deserved reputation at home and abroad; those of the Grand Valley are equal to the best. The Delaware peach is surpassed by the peach of the Grand Valley. The apples are famous for their variety and rare qualities. Numerous other fruits are equally successfully grown, as is, of course, the beautiful western clover, the alfalfa or lucerne.

The Grand River is one of the largest streams in western Colorado, carrying an enormous volume of water. An immense irrigating ditch or canal, known as the High Line, to be constructed by the United States Government, is designed to traverse the country immediately north of and to the westward of Mack, bringing all of the neighboring valleys and mesas under irrigation. A smaller irrigating ditch already intersects the valley at Mack. Homeseekers may well give consideration to this area as one possessing many advantages.

Through land such as has been described, the Uintah Railway passes for a distance of twelve miles, at which point it enters a canyon in the foothills of the Book Cliffs, and for sixteen miles on



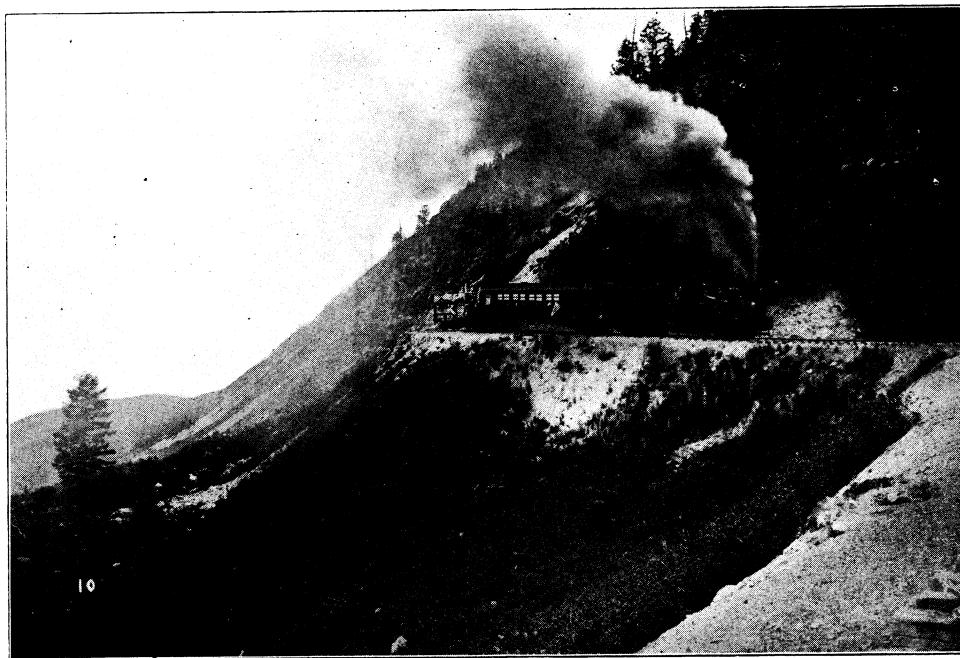
**VIEWS ALONG THE UNTAH RAILWAY, SHOWING SOME OF THE
HEAVIEST GRADES AND SHARPEST CURVES**

a steadily ascending grade it passes through scenery that is strikingly picturesque. The stillness is profound, broken only by the operations of the coal mines at the station Carbonera, eighteen miles from Mack.

At Atchee, twenty-eight miles out, are the shops and round-houses of the railway, at the base of the main range of the Book Cliffs. Here the trains begin their heavy climb toward the summit, with one mile of five per cent. grade, and thence on an uninterrupted grade of seven and one-half per cent., five miles further to the summit. Two thousand feet of elevation is attained in these six miles, by an engineering accomplishment that is unique in railroad enterprise and wonderfully beautiful in the natural characteristics of the country.

The Book Cliffs is a precipitous range extending upwards of two hundred miles in an east and west course from the mountains of Colorado to the Wasatch and Uintah ranges of Utah, crossing the broad valleys of the Grand and Green Rivers like a majestic rampart, and providing an unobstructed view on either side of hundreds of miles.

There are no other nearby mountains to shut off the view, as on other mountain railroads.



EXCURSION TRAIN JUST LEAVING THE STEEP MOUNTAIN SIDE, LOOKING TOWARDS BAXTER PASS,
PART OF THE ROAD WHERE PASSENGERS HOLD THEIR BREATH

Rising steadily up the face of this great range, there is never a moment when the eye of the passenger may not rest with perfect delight and wonderment upon a gorgeous panorama of slopes below, of valleys and deserts beyond, and of snow-clad mountain ranges in the far-off horizon. To the eastward, the great Continental Divide and the Grand Mesa; to the southeast, the precipitous San Juan mountains of Colorado, one hundred and fifty miles away; to the south, the Sierra La Sal in southern Utah, one hundred and sixty-five miles distant, rising in indescribable grandeur on the hither side of the valleys that lead to the Grand Canyon of the Colorado.

These views from the train windows are best appreciated when the summit is reached at Baxter Pass. Here, simultaneously, another panorama is unfolded on the north, as from the narrow summit the traveler sees the valley of Evacuation Creek stretching out to the Grand Canyon of White River, and, over the old Uncompahgre reservation to Raven Ridge and Blue Mountain on the north, eighty miles away, to Rabbit mountain and the White River plateau, many miles further distant in the northeast in Colorado; over the Uintah reservation and beyond to the Uintah

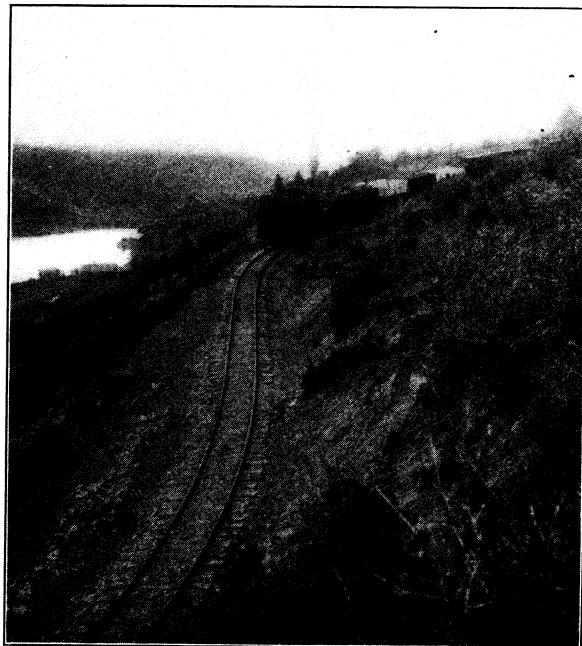
mountains in the northwest, one hundred and fifty miles; the breezes flinging through the pines and aspens on the neighboring summits, the blue vault above and eternal peace in all the atmosphere.

Everywhere there is grandeur, accentuated lights and shadows, marvellous combinations of color. It is soul-stirring, poetic, stimulating, satisfying and a never-ending appeal to the artistic sense.

Along the crest of this remarkable range, among its beautiful trees, by its springs of purest water, are rarest opportunities for those who would have recreation either in bungalow, cabin or tent; to escape the heat of summer, to be lotus-eating in a land of natural romance or, from such a rendezvous, to make tours to remoter fastnesses in search of largest game. Game there is for those that seek it—bear, mountain lion, bob-cats, grey wolves and the black-tail deer, the latter, of course, coming within the workings of the game laws. Old Indian trails, deep-furrowed, lead along the ridges, and wagon roads in excellent condition,



THE SNOW PLOW RETURNING WITH ONE SHAY LOCOMOTIVE AFTER
OPENING THE ROAD. THEY HAVE JUST PASSED
AROUND "MORO CASTLE CURVE."



ANOTHER VIEW OF TRAIN ON 5 1-2 PER CENT GRADE.
PULLED BY TWO SHAY LOCOMOTIVES

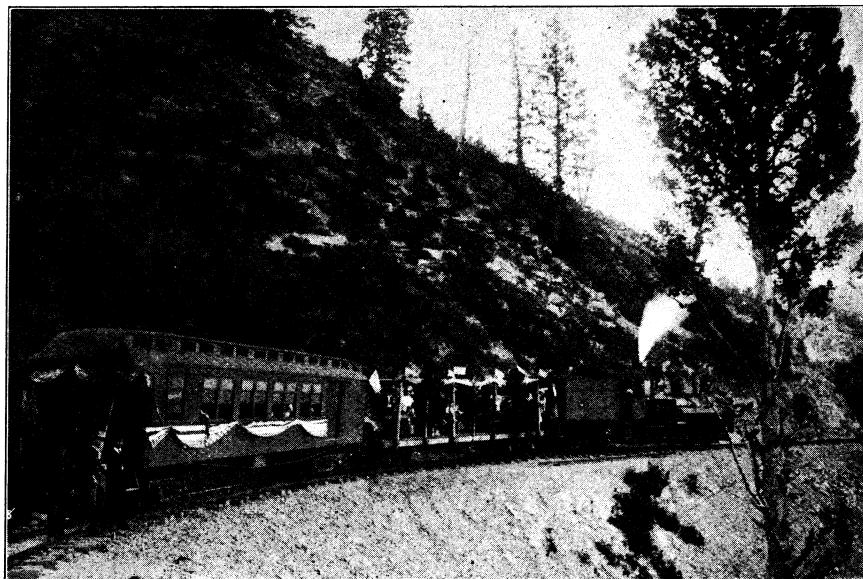
though, like Topsy, they have simply "growed." From these, new panoramas unfold in kaleidoscopic succession.

Who has not heard of the wonderful sunshine of the great inter-mountain country in the West, where there is an almost uninterrupted succession of cloudless days and starlit nights! Who does not love the pleasure of basking in the sunlight in an atmosphere free from humidity, and who does not know that in the combination of sunlight and ozone is the knell of the dreaded bacilli of disease! Out-of-door life in a country such as this will arrest the progress of pulmonary troubles, will rapidly enrich the blood in red corpuscles and, imparting a rollicking sense of joy in living, bring into play a rare combination of agencies for regeneration.

On the northern descent not quite so steep in grade as is the southern slope, the railway winds through alternating groves and parks to McAndrews Lake, an artificial storage reservoir five miles further on, whence the west

fork of Evacuation Creek leads on by curious hills and canyons to the northern terminus at Dragon.

There are Post Offices at both Mack and Dragon. Dragon is the forwarding point for passen-

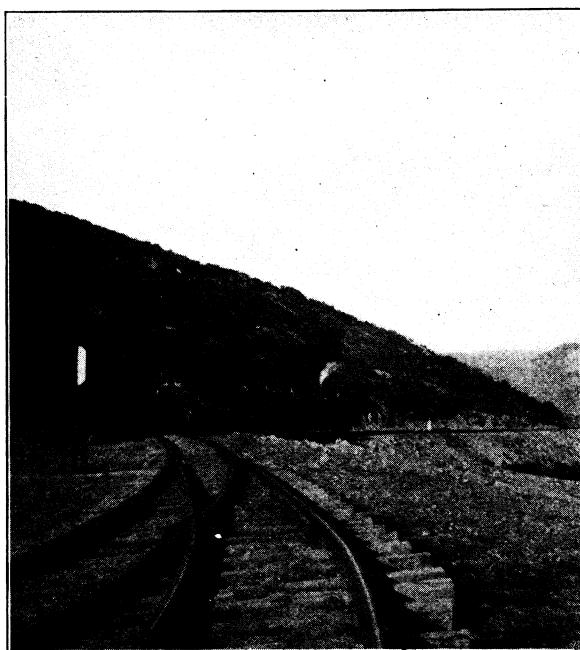


A FOURTH OF JULY EXCURSION BEHIND A SHAY LOCOMOTIVE GOING DOWN
THE 7 1-2 PER CENT GRADE

gers, freight, express and mail to Rangely and to the lower White River valley in Colorado and, in Utah, to Vernal and the Ashley valley; to the Ute Indian agencies at Ouray and White Rocks; to the United States Military Post at Fort Duchesne; and to the erstwhile Uintah Indian Reservation lying in the valleys of the Strawberry and Duchesne Rivers.

The Uintah Railway Company, for the convenience of its patrons, has constructed most comfortable hotels both at Mack and Dragon. Harmonizing with the country in which they are placed, they are in what might be termed the Adobesque Renaissance style of architecture, with walls of concrete. The lounging rooms and parlors are equipped with books, current magazines and daily papers, the dining-rooms are most inviting and the bed-rooms models of cleanliness and comfort. Lighted by gas, heated by steam, with the necessary luxuries of tub and shower baths and with most excellent cuisine, there is abundant invitation to both traveler and tourist to not only come, but linger. The railway, hotels and all connecting lines are operated throughout the year.

The Green River Basin, from its southern confines in the Book Cliffs on the south to the Wind River and Big Horn mountains of Wyoming on the north, was once a great inland sea. No other section of the world is so pro-



THIS PICTURE SHOWS AN EXCURSION TRAIN JUST TIPPING OVER ON TO THE 7 1-2 PER CENT GRADE GOING DOWN
EAST SIDE. ELEVATION 8460 FEET

lific in its yield of fossils. Monster saurians, many of them varieties not previously known to exist, have been taken thence to places in the world's museums. Careful and systematic as these inquiries have so far been by Government and collegiate expeditions, they yet have been but superficial. At and around Dragon fossils are scattered in profusion and in great variety. Only a few miles away, resting horizontally in a great rift of rock, lie the vertebræ of an immense snake or lizard fully sixty feet in length. To those whose minds turn with interest in directions such as these, a prolonged stay at Dragon will bring most interesting and profitable results.

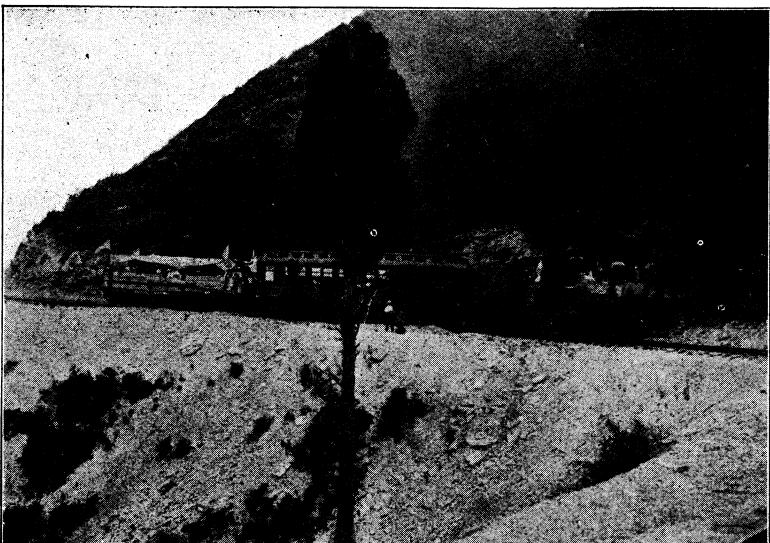
Connections are made at Dragon for points beyond by stages and automobiles operated in conjunction with the Railway Company, traversing well-made roads twelve feet in width of easy and beautiful curves and grades. These highways offer experiences that nowhere else are duplicated.

From Dragon, the route follows Evacuation Creek six miles through grey buttresses of lofty hills and mesas to the commodious corrals that the Railway Company has constructed for the convenience of the annual shearing of the vast herds of sheep that are brought to this point for shipment and for the shipment of their wool.

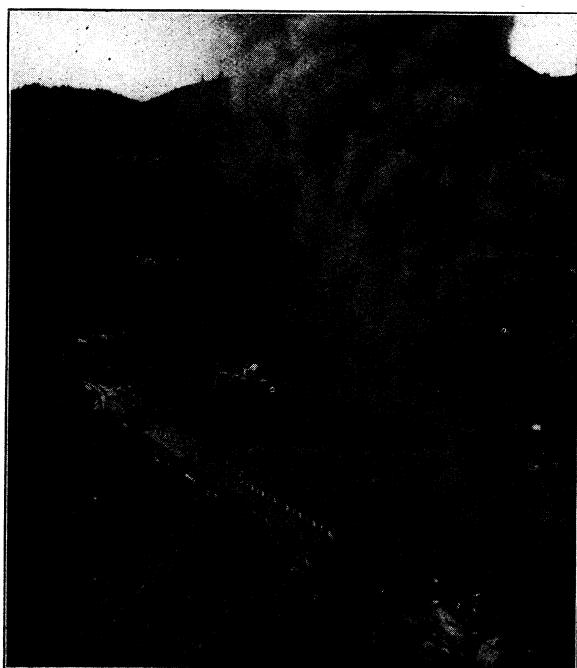
Just beyond is the beginning of Evacuation Canyon, to avoid which the road rises rapidly to the rolling ridge above. Here again bursts into view the great expanse of Green River basin, the Book Cliffs and Thimble Rock on the south and west, on the right, Hell's Hole, extraordinary in its ragged labyrinths, and, in the foreground below, the weirdest outlines of weathered sandstone ledges, while the road follows the smooth, undulating surface of the mesa.

Further on, the crossing of Evacuation Canyon on a well-constructed bridge, the ascent on the other side, and a view of the Canyon to its very bottom as the road stretches out along the western edge. Then a rapid descent into the tortuous Grand Canyon of the White River, its walls hundreds of feet deep, great masses of colors in reds, browns, greys and yellows, all ruthlessly riven, grotesque and terrible, as if they were the troubled dream of a Dore.

As words and pictures can give no adequate



SHAY LOCOMOTIVE AND EXCURSION TRAIN STANDING ON THE FAMOUS "LONE TREE CURVE," FROM WHICH POINT SIX TRACKS ARE SEEN BELOW AND A CLEAR VIEW NEARLY 2000 FEET BELOW

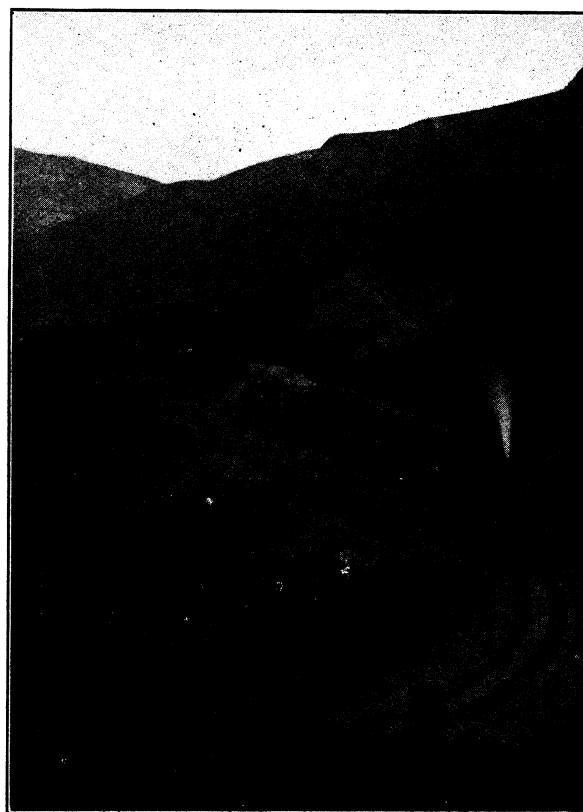


COMPANY OF SOLDIERS ON WAY TO PHILIPPINES FROM FORT DUCESNE, UTAH; TRAIN ON 5 1-2 PER CENT GRADE ON WEST SIDE PULLED BY SHAY LOCOMOTIVE

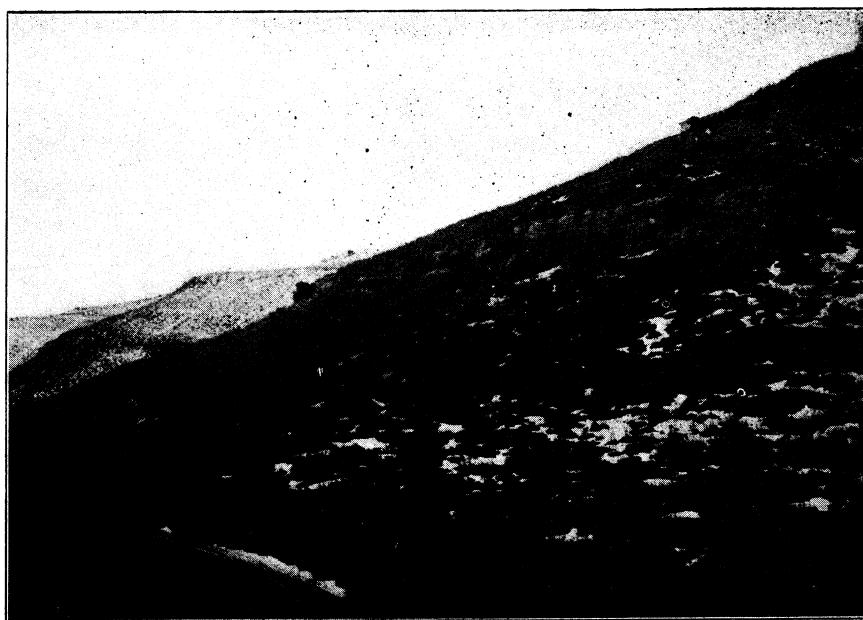
conception of the Grand Canyon of the Colorado, so do they fail in any attempt to express the stupendous vagaries of nature here, for the Canyon of the White River, though on a smaller scale, is a counterpart of the Grand Canyon of the Colorado, the formations are the same and the processes of making all alike. It must be seen to be appreciated; it must be felt to be understood; and once seen, once felt, it will never be forgotten, for the solemn awe which fills the soul of the onlooker may never be effaced.

The crossing of White River at Ignatio is on a two-span truss bridge, whence for a mile the road skirts the bank before entering Valhalla. Here the gods have played sport with mountain sides and tops, and in the echoes throw out again deep chuckles of their mirth. Vast amphitheatres, obelisks, temples, towering pinnacles, all in confusion worse confounded. Owls and ravens silently slip from their perches and flap uncannily off to some remoter resting place.

Four miles from White River brings one again to the upper level of the Green River basin and to the very comfortable Station at Bonanza, where meals are served and where a limited



NEAR THE BOTTOM OF STEEP GRADE ON EAST SIDE, SHAY LOCOMOTIVE WITH EXCURSION TRAIN



THIS VIEW SHOWS ONE TRACK ABOVE THE OTHER LESS THAN HALF A MILE AWAY, AROUND THE 7 1-2 PER CENT GRADE

number may find sleeping accommodations, should they so desire.

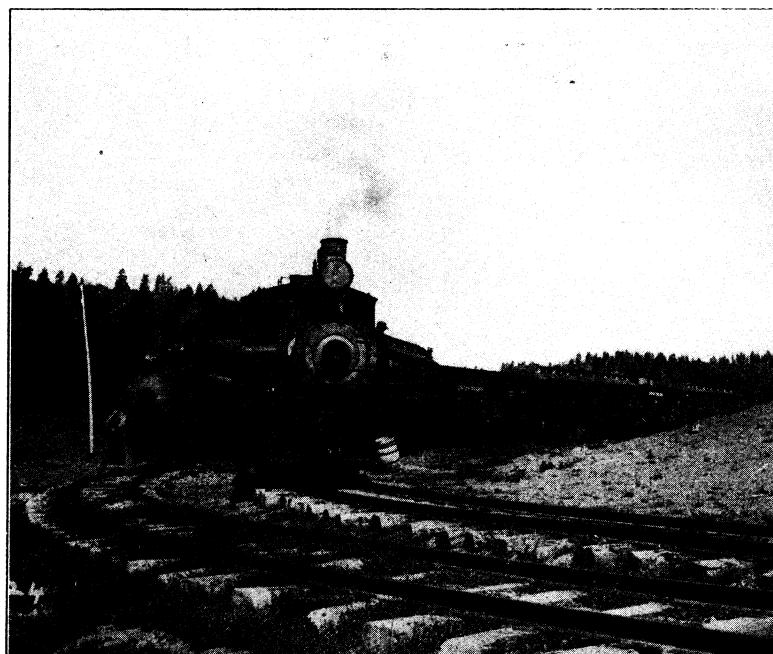
The road branches at Bonanza, one route leading eastward, crossing White River Canyon again, to Rangely, Colorado; another northwesterly to Vernal and the Ashley Valley, and the third to the Indian agency at Ouray and Fort Duchesne beyond. Leaving Bonanza, the road to Vernal crosses Coyote Basin, —suggestive name—where that restless denizen of the plains, versed in many of the wiles of modern business life, is accustomed relentlessly to harass the droves of sheep, with results that are at once satisfying to himself and impoverishing to the owner. Thence over Dead Man's Bench, of gruesome history, to another hotel and way-station at Kennedy, ten miles beyond Bonanza also a point where the traveler will find most comfortable accommodation. Fourteen miles further on, ferries have been constructed which provide a crossing, six hundred feet in width, over Green River at Alhendra, whence again, by easy grade, the road leads on to Vernal, thirteen miles. Or, from Bonanza, by the Southern route ten miles to a hospitable wayside inn at Chipeta Station, and on to the lower Green River ferry at Ouray, former agency and present tribal center of the Uncompahgre Utes. Thence it is thirteen miles to Fort Duchesne.



THIS PHOTO TAKEN FROM CAB OF A SHAY LOCOMOTIVE FOLLOWING THE SNOW PLOW TO LEND ASSISTANCE WHERE NECESSARY. WHERE THE MOUNTAIN SIDE IS STEEPEST, TOO STEEP FOR ABOUT 800 FEET FOR A PERSON TO DESCEND. THE GRADE IS 7 1-2 PER CENT

Vernal is the county seat of Uintah County and the location of the United States Land Office for all the lands in Uintah County and that part of the lands in Wasatch County that were included in the Uintah reservation. Thus all of what was the Uintah reservation is embraced within the Vernal land district.

Vernal is a most charming town, in the center of Ashley valley, with bank, public schools and well-paved streets. Within a comparatively short radius, there are about eight thousand people. Agriculture is their principal occupation, and wonderful is the output of the Ashley valley



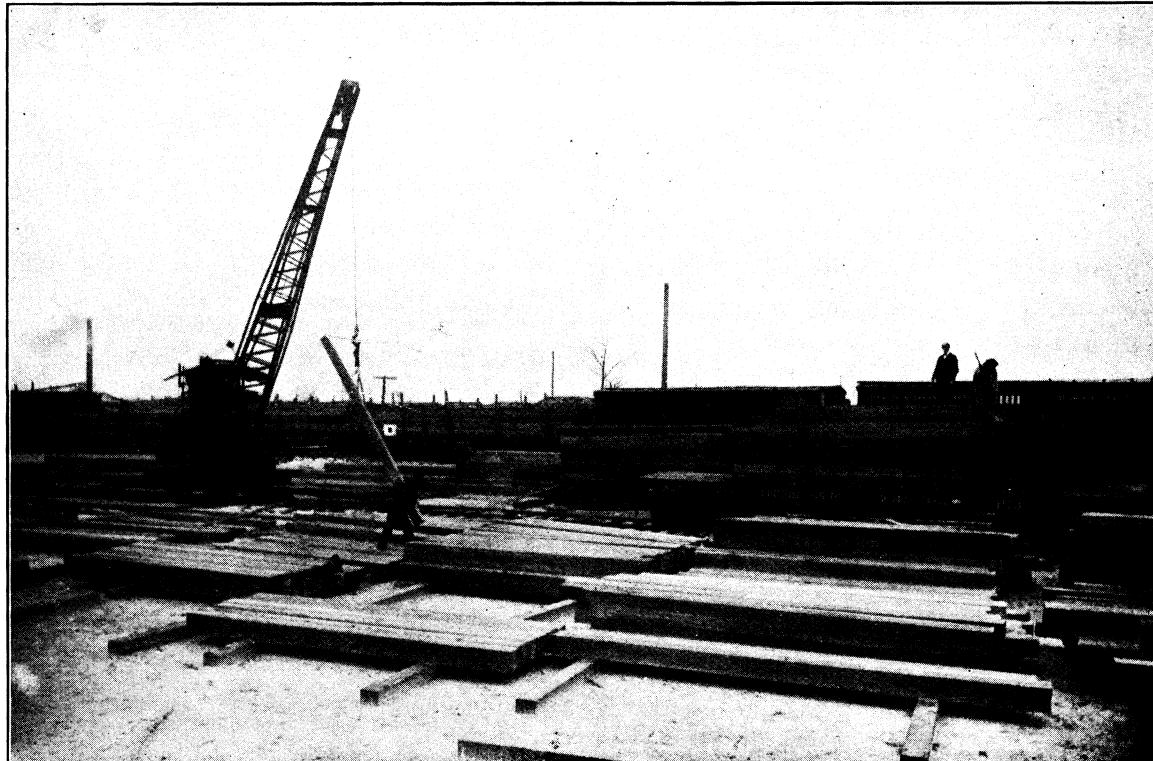
SHAY LOCOMOTIVE HANDLING TRAIN OF SOLDIERS ENROUTE FROM FORT DUCHESNE TO PHILIPPINES; GETTING READY FOR DESCENT OF 7 1-2 PER CENT GRADE

"DID YOU EVER STOP TO THINK"

Of the Time and Labor a

BROWNING LOCOMOTIVE CRANE

Would save you in handling your logs,
or in building your logging roads?



Possibly you are not aware of the fact, but our machines can be fitted with an Automatic or Drag Scraper Bucket, a Steam Shovel Dipper or Pile Driver Hammer and Leads, all of which are readily interchangeable with the other.

You could not find a more versatile outfit for use in the woods, at the mill or yards.

Our new 1912 Catalogue will interest you.

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Just say you saw this ad in The Locomotive World.



¶ There's a whole lot to a brake beam.

¶ A whole lot of economy if its a good brake beam and

¶ A whole lot of expense if its a poor one.

¶ Every expense is an investment—either good or bad.

¶ Paying the Chicago Railway Equipment Company money for brake beams is an expense that is an investment that pays big dividends.



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in its fruits and honey, in the dairy products, live stock and hay and grain. The apple orchards are fair to look upon and bear such fruit as will cause great surprise. An apple twelve inches in circumference is no uncommon thing and so richly are the branches laden that props are often used to save them from destruction.

The streets and all the highways in the valley are fringed with trees, as one may see in Holland. Brooks of clear running water skirt the roadsides. The purple blossom of the deep green alfalfa fills the air with fragrance, yielding the bees unspeakable delight. It is a garden spot of not many years' existence, once wholly arid, and now an enchanting Vale of Cashmere.

The soil values of this extraordinary country lie in the great depth, varying from ten to fifty feet, of an absolutely homogeneous product of disintegration of the hills. The process has been complete, mechanically and chemically, with a resultant material that is most perfectly adapted for cultivation, and that, because of its great depth, is practically inexhaustible. The annual precipitation of twelve to sixteen inches of rainfall is, of course, in itself inadequate to the farmers' needs. But instantly the streams are tapped by ditches and canals and a well-regulated flow of water is applied, fertility is accomplished and in a bountiful degree. Not only do the irrigating ditches supply the needed moisture but in the very water which they carry there are, in solution, those mineral constituents which unceasingly fertilize and revivify the ground, though that indeed may never seem a need for several generations.

The Uintah Indians, so-called, are the living representatives of what were once the Uncompahgre Utes and the White River Utes of Colorado. Some twenty years ago they were, by treaty, moved from Colorado into Utah. The current year has brought about the completion of those processes by which Congress and the Interior Department have wiped away the exclusive Indian domain, allotting lands in severalty to each one of the members of the Tribes and placing the remainder subject to entries under the land laws of the United States. The allotment of lands to the Indians gave eighty acres to the head of each family, and, to each other member of a family, an additional forty

acres. Thus approximately 300,000 acres have been allotted, leaving, it is said, 2,000,000 acres, a considerable portion of which can be brought under irrigation, to be restored to the public domain.

The Indians are most peaceable in manner and habits of life, have adopted citizens' garb, in some instances speak English, and will, many of them, avail of the opportunity to work for wages. They have made advances in the understanding of farm operations and the methods of irrigation.

A Military Post of the United States Army is located at Fort Duchesne, at the confluence of the Uintah and Duchesne Rivers.

In the vicinity of Fort Duchesne, new towns have sprung into life, called Moffat, Myton and Leland, the attractions of which will be cheerfully expounded on the ground by those who have become convinced that these will be of the important, if not the most important, new towns that the opening of the reservation will bring into being.

The altitudes within this country range from about five thousand feet at Fort Duchesne to a little less than six thousand feet at Vernal, and to higher altitudes attained on the mesas as the rivers are followed toward their source. Except in the very highest of the mountain ranges, the seasons are normal in their length and temperature, the snowfalls of winter light, the degree of cold not excessive, and, as it is true of all mountain atmospheres, most easily and pleasantly borne.

Telegraph and telephone service along the line of the Uintah Railway Company connects Fort Duchesne, Vernal, Rangely, Bonanza and all intermediate points with Mack and distant cities. There is daily carriage of mail and express in both directions. Goods by freight are brought from Dragon to Vernal and Fort Duchesne in rapid transit freighting outfits with promptness and despatch, in less than four days' time.

The equipment of the Uintah Railway consists of the most modern types of Baldwin and Shay locomotives, of Pullman cars and standard coaches, of observation cars and gasoline track automobiles.



HIGH SPEED



"StancO" High Speed Drills are marvels of efficiency. They work in metal that other drills won't touch, and they win on merit alone.

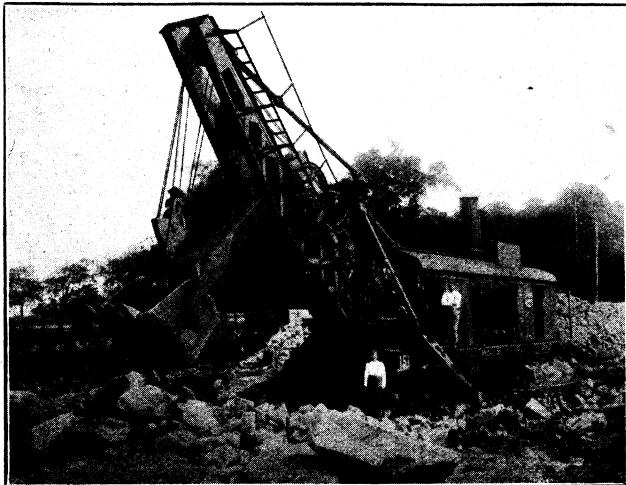
Try these drills on your own work; test them in every way and you'll find them true High Speed Drills in every sense of the word.

THE STANDARD TOOL CO

Home Office and Factory, CLEVELAND, OHIO
SIXTH CITY

Eastern Branch, 94 Reade St., New York Western Branch, 552 W. Washington Blvd., Chicago

VULCAN STEAM AND ELECTRIC SHOVELS



Are built in Standard and Revolving types to meet all requirements.

Heavy-Duty Shovels in all standard sizes from 45 to 120 tons, suitable for all classes of heavy contract work, rock excavating, etc.

Also the well known Little Giant Shovel, of which over four hundred are in use throughout the country.

Revolving Shovels in three sizes, 15 to 40 tons, 1-2 to 1 1-2 cubic yard Dippers.

Locomotive Cranes and Dipper Dredges.

WRITE TODAY FOR FULL INFORMATION AND PRICES

THE VULCAN STEAM SHOVEL COMPANY, Toledo, Ohio

Eastern Office, 50 Church Street, New York

Just say you saw this ad in The Locomotive World.

DETROIT SEAMLESS STEEL TUBES COMPANY

Makers of

“Detroit” Locomotive Flues

“Detroit” Safe Ends

“Detroit” Arch Tubes

“Detroit” Mechanical Tubing

ALL

Seamless

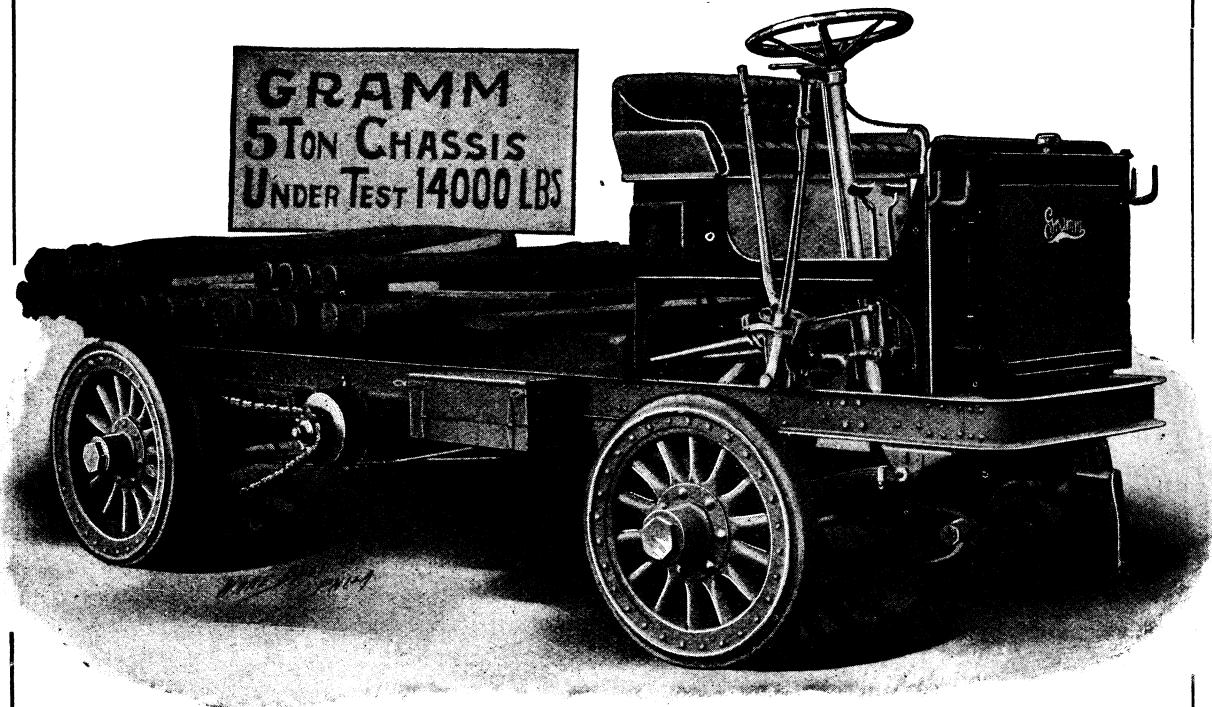
Cold Drawn Steel

General Office and Works

DETROIT, MICH.

“Gramm”

Winner of the Boston, Philadelphia, Chicago
and San Francisco Endurance Contests



A GRAMM 5-TON TRUCK BEING TESTED UNDER
A LOAD OF 14000 POUNDS AT THE FACTORY

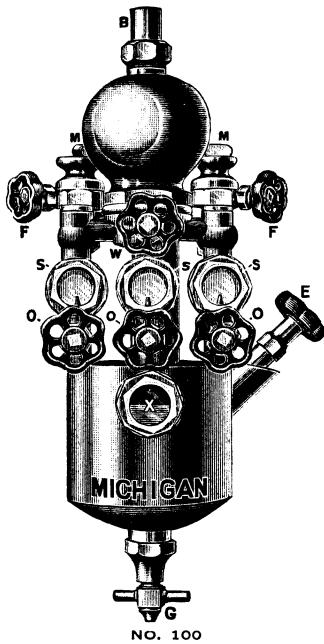
For RELIABILITY
PRACTICABILITY and ECONOMY.

Built in sizes of 1, 2, 3 and 5 tons, a size
for every business. Our catalog, which
will be sent on request, explains the
trucks in detail.

GRAMM MOTOR CAR CO.
LIMA, OHIO

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Michigan Bullseye Locomotive Lubricator



Equipped With

Michigan Patent Steam Chest Plugs

Michigan Automatic Drain Valve

Independent Auxiliary Oilers

Made of the Highest Grade Materials

All Parts Absolutely Interchangeable

MICHIGAN LUBRICATOR CO., Detroit, Mich.

80 to 90 Per Cent of TIME SAVED. Absolutely No Calculating to do.
JUST ADD TOTALS

Fleming's Lumber Calculator

Only Complete, Up-to-Date Lumber Calculator Published. Nearly 10,000 Sizes and Lengths Shown

All fractional sizes by quarter inches and all lengths in both feet and inches covering all Car Sills, Car Framing, Railroad and Hardwood material, as well as all other kinds of Lumber, one to six inches thick by quarter inches. Marginal index to locate size. When book is opened to any desired size all calculations for that size are in front of you, from one inch to longest length used from one to one thousand pieces, calculations carried four points beyond the decimal.

The various officials of over 50 of the leading railroads throughout the United States, Canada and Mexico and hundreds of Manufacturers, Wholesale and Retail Lumber Dealers have bought one to six books each. Why not you?

Price \$4.50 f. o. b. Lima, Ohio, as long as they last.

THE LOCOMOTIVE WORLD, Lima, Ohio

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Directory of Railway, Locomotive, Engineering and Mining Journals

Railway Age Gazette

A Consolidation of Railroad Gazette and The Railway Age

The World's Leading Railway Journal

And the only paper that completely covers all branches of railway activity

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Association.Has long been acknowledged the most interesting Technical
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LIMA, OHIOWrite for Prices. They will
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F. F. VAN TUYLConsulting
Engineer**Plans and Specifications**For the Complete Equipment of Steam and Electric
Power Plants of all sizes

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ROBERT W. HUNT & CO.

Locomotive and Car Inspectors

Only competent and reliable men employed

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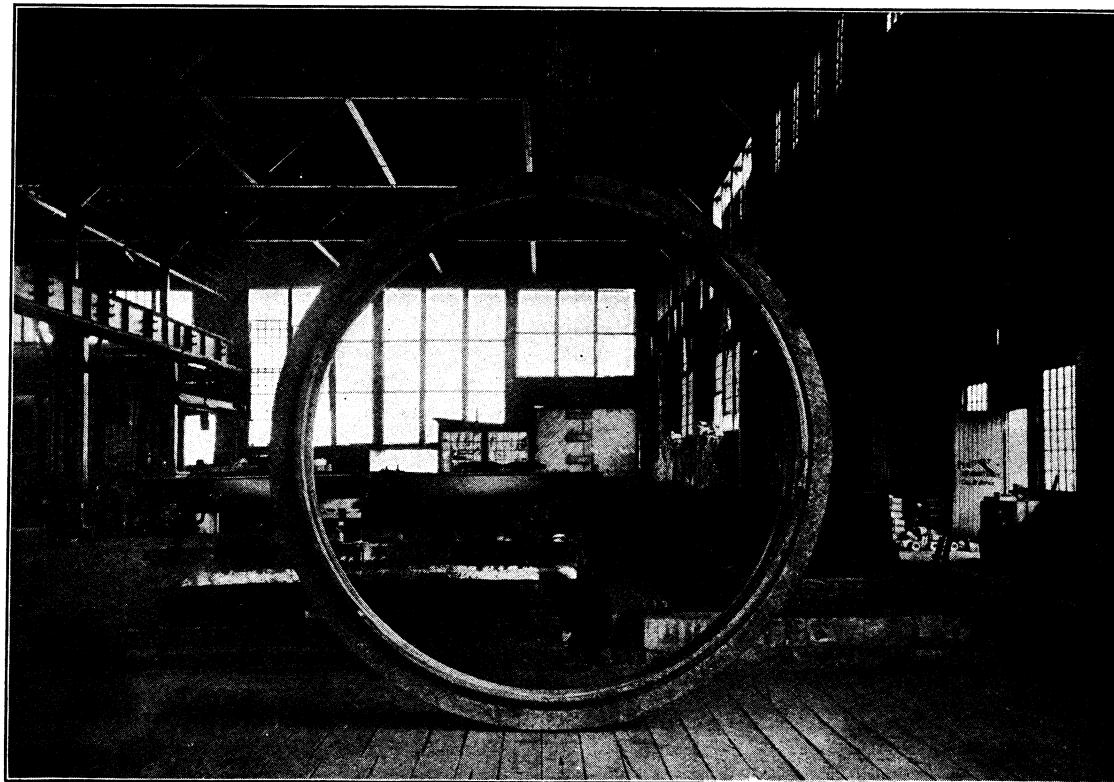
St. Louis

San Francisco

Montreal

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STEEL CASTINGS



The above cut shows one of the steel rings we have just poured for a cement mill.
It weighs 8,500 lbs. and is 10 feet 8 inches in diameter

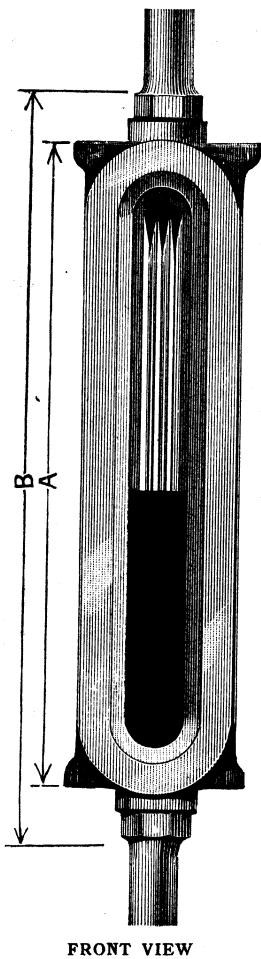
We are prepared to turn out steel castings of any size, for all classes of work. Give us a trial; no order too small or too large to receive our prompt attention

OHIO STEEL FOUNDRY CO.
LIMA, OHIO

Self-Adjusting Reflex Water Gauge

The "Wiltbonco"

Without Connections



AS SUPPLIED
TO REPLACE ORDINARY
GAUGE GLASSES

No.	SIZES		
	LENGTH		Length of Observ'ti'n Glass
	A	B	
0	4 $\frac{3}{4}$ "	6 $\frac{1}{4}$ "	3 $\frac{1}{4}$ "
1	5 $\frac{1}{4}$ "	6 $\frac{3}{4}$ "	3 $\frac{7}{8}$ "
2	6 $\frac{1}{4}$ "	7 $\frac{3}{4}$ "	4 $\frac{7}{8}$ "
3	7 $\frac{1}{4}$ "	8 $\frac{3}{4}$ "	5 $\frac{7}{8}$ "
4	8 $\frac{1}{4}$ "	9 $\frac{3}{4}$ "	6 $\frac{7}{8}$ "
5	9 $\frac{3}{8}$ "	11"	8"
6	10 $\frac{1}{2}$ "	12"	9 $\frac{1}{4}$ "
7	11 $\frac{1}{2}$ "	13 $\frac{3}{4}$ "	10 $\frac{1}{4}$ "
8	13 $\frac{1}{4}$ "	14 $\frac{3}{4}$ "	12"
9	14 $\frac{1}{4}$ "	15 $\frac{3}{4}$ "	12 $\frac{1}{2}$ "

NOTE—"A" represents length of gauge body, while "B" represents shortest distance permissible between faces of packing nuts without crowding. End nipples are supplied $\frac{5}{8}$ in. or $\frac{3}{4}$ in., O. D., and any length desired.

Is the Gauge that is meeting with such success on the large railroads of this country.

The glass never flies, which gives your Enginemen and Boilermen absolute protection.

The water appears black, the steam white. No mistakes possible. Easily seen in dim lights.

This Gauge permits the gauge valves to be wide open. This eliminates all possible chance of corroding.

This type of Gauge is standardized by the leading railroads of the world, and on all naval vessels.

Why? Because it is absolutely safe.

At a small additional expense you can protect yourself and your men. It certainly is worth investigating.

We guarantee the glass not to fly.

The Best Gauge in World
for a Locomotive

JERGUSON MANUFACTURING CO.

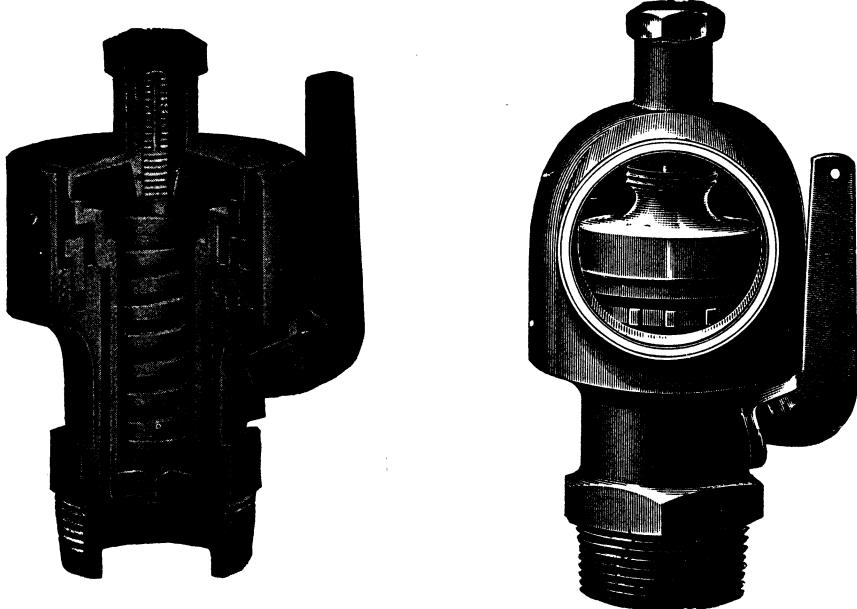
Pope Bldg., Room 64-A.

BOSTON, MASS.

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KUNKLE
POP SAFETY VALVE
FOR
Portable, Stationary, Locomotive
and Marine Boilers

OVER 1,000,000 IN ACTUAL USE



Ft. Wayne Safety Valve Works

E. B. Kunkle & Co.

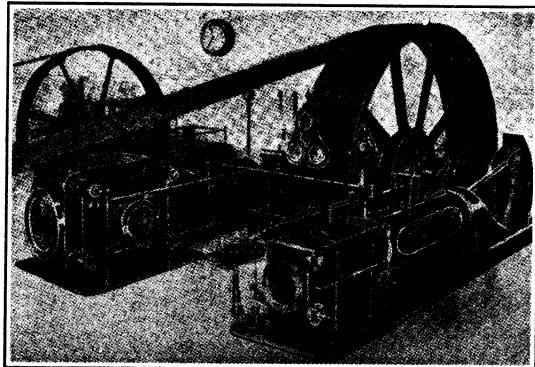
817 Barr Street

Ft. Wayne, Ind.

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THE BASS FOUNDRY and MACHINE CO.

FORT WAYNE, IND.



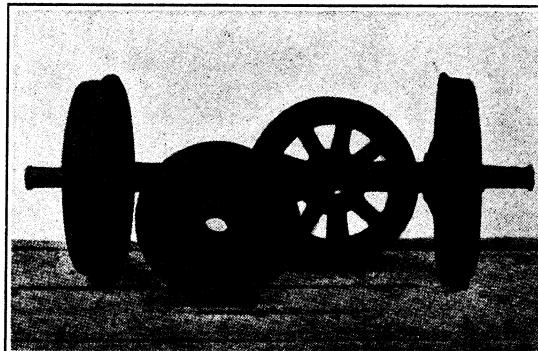
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CORLISS ENGINES, Compound, Condensing and Simple, for Factory, Rolling Mill, Electrical and Street Railway Service.

Also Water Tube and Tubular Boilers, Feed Water Heaters and all Appliances for Complete Modern Steam Plants.

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Hammered Iron and Steel Axles, Driving Axles, Locomotive Frames, Connecting and Piston Rods, Crank Shafts of Single, Double and Triple Throw, and Iron and Steel Forgings of every description.



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Superior Chilled Iron Wheels for Cars, Tenders and Locomotives, Car and Locomotive Castings, Cylinders, Driving Wheel Centers, also Machinery and Miscellaneous Castings.

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PITTSBURG WHITE METAL CO. PITTSBURG NEW YORK

**The VITAL POINT in the EQUIPMENT of all
MACHINERY is the BABBITTING**

After years of experience, we are offering

Armature Anti-Friction Metal

For all purposes where a good metal of uniform quality is required. This metal can be used for Engines of any description, Dynamos, Flour, Planing and Rolling Mills, Agricultural Machines, Electric Railways, and, in fact, wherever good service, under general conditions, is required.

The ingredients of ARMATURE permit its use in place of Genuine Metals, as the AMALGAMATION IS PERFECT.

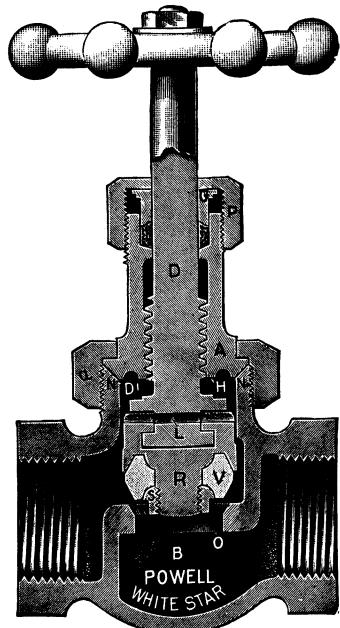
PRICE CONSISTENT WITH QUALITY

"The Quality is remembered long after the Price is forgotten."
—Armature.

PITTSBURGH WHITE METAL CO.**PITTSBURGH****PHILADELPHIA****BOSTON****NEW YORK**

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THE REVERSIBLE DISC OF THE POWELL WHITE STAR VALVE



Practically gives you two valves for the price of one.

Regrind one side of the disc until it is worn out, then turn it over and start on the other side. When both sides of the disc are worn out, buy a new disc and start all over again.

Discs don't cost much comparatively---valves do.

Plenty of metal in the diaphragm for refacing seat.

Your jobber has them
in stock---ask HIM

THE Wm. POWELL Co.



DEPENDABLE ENGINEERING SPECIALTIES.

CINCINNATI

QUALITY and SERVICE HAS PLACED THE RUSSEL LOGGING CARS FOREMOST AMONG THE AMERICAN LOGGERS

Built for any capacity or to accommodate any length of log desired. Connected Truck Type for single or double length logs from 20,000 to 80,000 lbs. capacity. Pacific Coast Type Detached Trucks from 80,000 to 100,000 lbs. capacity.

SKIDDING AND LOADING MACHINERY,
DUMP CARS

RUSSEL WHEEL & FOUNDRY COMPANY
DETROIT, - - - MICHIGAN

Just say you saw this ad in The Locomotive World.

Jeffrey Conveyer Handling Refuse to Burner



This CONVEYER is 350 feet long (2 sections, one 150 and one 200 feet) handles the entire refuse from an 8-foot band and gang mill with daily capacity of 85,000 feet of lumber.

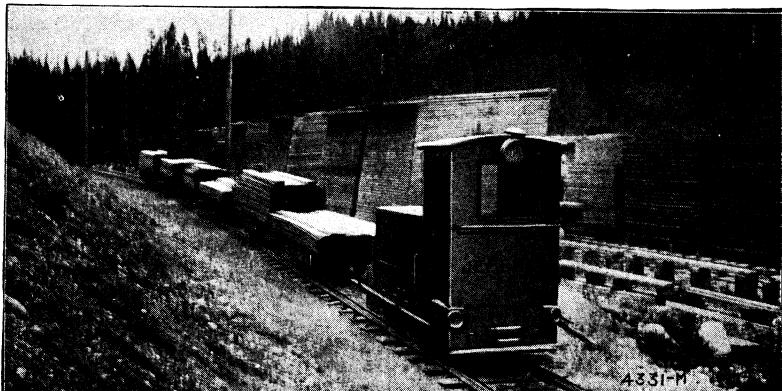
J E F F R E Y CHAINS and ATTACHMENTS are adapted for all practical Sawmill requirements.

Jeffrey Locomotives

Equipped with Edison Storage Batteries for

Lumber Yards

Tell us how much lumber you are handling and the cost per 1000 ft. and let us explain the superior features of our equipment.



Write for Catalogs
 Storage Battery Locomotives No. 13
 Conveyers for Saw Mills 57

THE JEFFREY MANUFACTURING CO., Columbus, Ohio

Chicago
 St. Louis
 Denver

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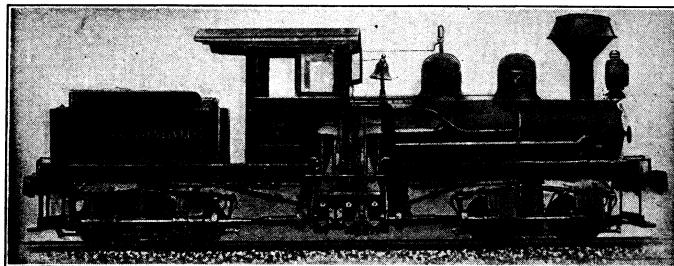
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FOR SALE

Second - Hand Locomotives

All Sizes and Types



A PARTIAL LIST

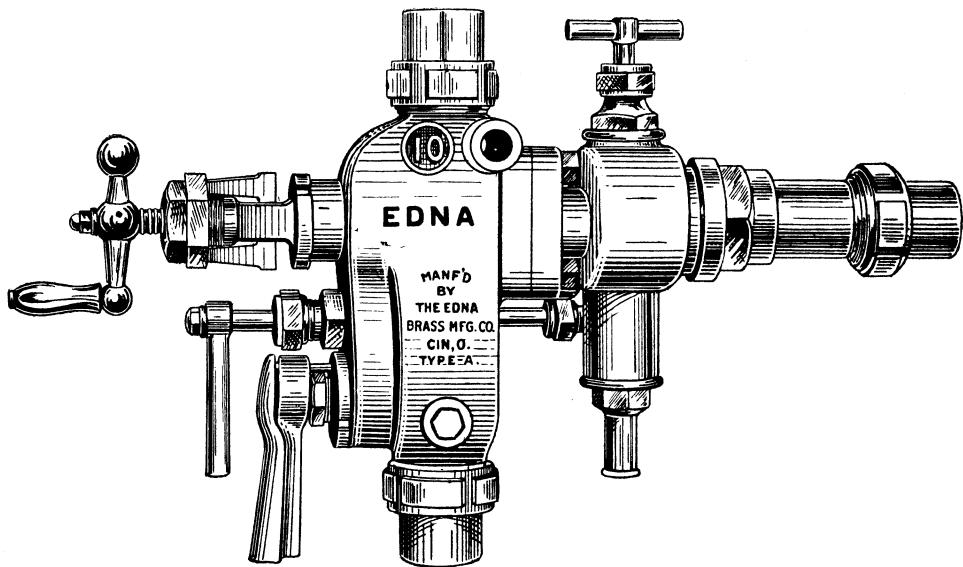
TONAGE	TYPE	GAUGE	LOCATION	REFERENCE NO
1 13	Shay	56½"	Georgia	0829
1 15	Shay	42 "	Mississippi	0810
1 15	Shay	56½"	South Carolina	0818
1 17	Shay	56½"	South Carolina	0819
1 18	Shay	56½"	Tennessee	114
1 18	Shay	36 "	Tennessee	086
1 28	Shay	56½"	Arkansas	0828
1 30	Shay	36 "	New York	101
1 33	Shay	56½"	West Virginia	0825
1 37	Shay	56½"	Michigan	0826
1 55	Shay	56½"	New Mexico	0832
1 65	Shay	56½"	New Mexico	083
1 65	Shay	56½"	New Mexico	0831
1 30	4 Wheel	56½"	Mississippi	0833
1 30	Mogul	56½"	Mississippi	112
1 35	Mogul	56½"	Mississippi	089

Write for full information and price on the above Equipment.

We have Seventy 30,000 Capacity Log Cars Ready for Immediate Shipment.
Write for Prices.

THE LIMA EQUIPMENT COMPANY
LIMA, OHIO

THE Edna Brass Manufacturing Co. Cincinnati, Ohio



Manufacturers of

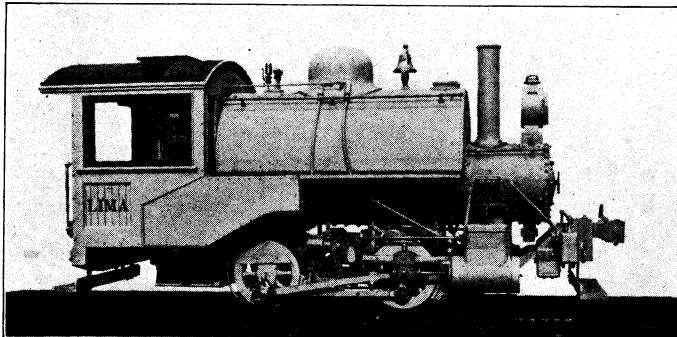
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Boiler Checks, Brass and
Bronze Castings, Etc.**

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LIMA LOCOMOTIVES

LOGGING----INDUSTRIAL----CONTRACTORS'



LIGHT INDUSTRIAL LOCOMOTIVE

TWO LIGHT INDUSTRIAL LOCOMOTIVES,
SUITABLE FOR STONE QUARRIES, BRICK AND
CEMENT PLANTS, MILLS,
FURNACES, ETC.

IN STOCK FOR
IMMEDIATE SHIPMENT

General Description below

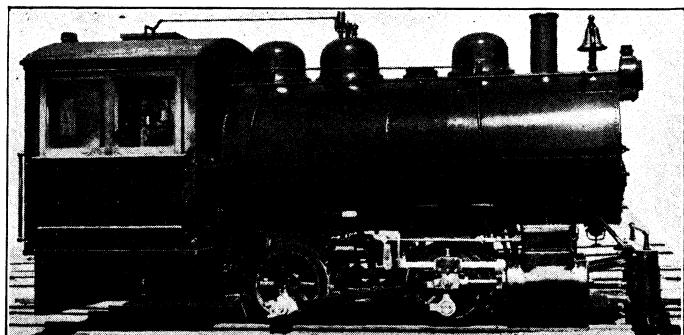
CODE WORD:	FABEINDUS
Type	0-4-0-S
Cylinders	9 x 14
Boiler, type	St. Top
Boiler, size	29 $\frac{1}{2}$ " dia.
Tubes, size	2" dia
Tubes, number	37
Tractive Power	5500 lbs.
Gauge	56 $\frac{1}{2}$ "

CODE WORD:	FAKELINDUS
Type	0-4-0-S
Cylinders	10 x 16
Boiler, type	St. Top
Boiler, size	34" dia.
Tubes, size	2" dia.
Tubes, number	58
Tractive Power	7250 lbs.
Gauge	56 $\frac{1}{2}$ "

THIS CONTRACTORS' LOCOMOTIVE

Code Word	Limcon
Type	0-4-0-S
Cylinders	10 x 16
Boiler, type	St. Top
Boiler, size	37 $\frac{1}{4}$ " dia
Tubes, size	2"
Tubes, number	84
Tractive Power	7250 lbs.
Gauge	36"

IMMEDIATE SHIPMENT



LIMA CONTRACTORS' LOCOMOTIVE

IF INTERESTED WRITE OR WIRE FOR FULL DESCRIPTION

THE LIMA LOCOMOTIVE & MACHINE CO.
1093 South Main St., Lima, Ohio

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Economy of Operation

Is ONE of the essentials to be considered
when comparing the initial cost of
a Steam Log Loader



Average Cost of Loading Logs with above "American" Log Loader, purchased 9 years ago, 10 1-2c per 1000 feet.

EVERYTHING INCLUDED

(See our next ad.)

SEND THE COUPON AND
GET FULL PARTICULARS

AMERICAN HOIST & DERRICK CO.

St. Paul, Minn.

1 Name _____
Address _____
Please send full particulars
regarding "American" Log Loader
Hoist & Derrick Co.
St. Paul, Minn.

A Billion-and-a-half Feet

Per Year LOGGED and LOADED by

Lidgerwood Cableway Skidders

(ONE OF OUR LEADING SYSTEMS)

This system was originally introduced with the tree rig for Cypress Logging, but is now extensively used also in the completed or portable style, with a steel spar as shown in the cut below.

AN IDEAL SYSTEM FOR A LARGE VARIETY OF OPERATIONS.

Machine built either with straddling legs to allow cars to pass underneath or mounted on steel trucks.



PORTABLE CABLEWAY SKIDDER WITH STEEL SPAR AND BOOM LOADER

Changing lines and tightening cables all done with steam by auxiliary drums on the skidding car. Built in styles and sizes adapted to the special conditions of each section of the country.

NEARLY TWO HUNDRED USERS OF CABLEWAY SKIDDLERS—Fifty-six concerns alone use 122 of these Machines and Use No Other.

Lidgerwood Manufacturing Company
96 Liberty Street, NEW YORK

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CANADA, Allis-Chalmers-Bullock, Ltd., Montreal and Vancouver